

LAKE GASTON RETAINS CASH FLOW ON THE PIPELINE WITH DEMAND RESPONSE



September 2018



CASE STUDY: LAKE GASTON

LAKE GASTON WATER SUPPLY PIPELINE: Virginia Beach, VA.

Faced with the prospect of losing hundreds of thousands of dollars in demand response revenue, this Virginia Beach site discovered a way to keep the money flowing without interruption.

The Customer: Lake Gaston Water Supply Pipeline

The Lake Gaston Water Supply Pipeline, also known simply as Lake Gaston, is at the heart of the economic vitality of the City of Virginia Beach (see our City of Virginia Beach case study). Located west of the city, on the North Carolina border, Lake Gaston employs six vertical-turbine centrifugal pumps, each with a nominal capacity of 10 million gallons per day, to supply Virginia Beach with the 30 million-plus gallons of treated drinking water that its residents consume each day. (The high-capacity pumps give the station the flexibility to increase pumping up to 60 million gallons per day.) The water flows through a 76-mile-long pipeline (which includes six overhead river crossings) from the lake to facilities in nearby Norfolk for treatment.



Since 2010, Lake Gaston has participated in the demand response program offered by CPower through Virginia's Department of Mines, Minerals and Energy (DMME). This program pays government entities market rates for curtailing their electricity usage during times of high demand on the grid. Participants save on their energy costs and earn revenue that can be reinvested in upgrades, energy efficiency projects, and more. Lake Gaston's participation has earned them nearly half a million dollars since 2011 (see chart below).

Steven Poe, the city's Water Master Planner, assumed management of Lake Gaston in 2015. At the time, Lake Gaston had already earned more than \$221,000 in DR participation, and Steve understood he could count on a continuing and beneficial revenue stream. Unfortunately, he hadn't counted on a court ruling that dramatically changed the role of emergency generation in demand response.

The Challenge: Confronting the Vacatur

In 2013, the federal Environmental Protection Agency (EPA) issued emission standard exemptions that permitted emergency generators to operate up to 100 hours a year for "emergency demand response." Lawsuits from environmental groups, state governments, and commercial power generation groups challenged the EPA's ruling, saying it would hurt air quality and grid reliability. In May, 2015, the United States Court of Appeals for the DC Circuit vacated the 100-hour rule (on procedural grounds). This vacating ruling, dubbed "the Vacatur," would take effect on May 1, 2016.

The Vacatur threatened to have a disastrous impact on Lake Gaston's DR participation—and earned revenue. Lake Gaston was designed to pump continuously, and could not



Lake Gaston Pump House

do so without the use of its diesel engine generator.

The Vacatur left Steve no choice but to withdraw his diesel-powered generator from the DR program. Without it, he not only faced loss of revenue from its participation, but potentially the loss of all DR revenue. If the generator could not be used to sustain pumping during curtailment, then Lake Gaston would not be able to curtail the required power during a called event without jeopardizing Virginia Beach's water supply. The pumps, then, would also have to be pulled from the program, essentially shutting down the lucrative revenue stream.

Or would they?

Steve felt that the financial benefits of DR participation warranted a closer look for a creative solution. "When we realized we couldn't curtail anymore with our generator, we didn't want to miss out on the incentives," he says.

But to reach their target, they would have to conduct a full shutdown. Could they shut the pumps down—and bring them back up—without damaging both pumps and pipelines? And if they could, would that be enough to continue in DR without damaging their savings and earnings and effectively eliminated generators from demand response?

The CPowered Strategy: Shut 'Em Down

Full shutdowns are rare in nearly all industrial settings, but Lake Gaston had a precedent. In 2014, a 39-ton coal ash spill on one of the lake's tributaries forced the pump station to shut down for about two months. This was the first extended shutdown of the pump station in its history and caused a great deal of concern. Lake Gaston was designed to maintain a minimum sustainable pumping rate of eight million gallons per day flowing through the pipeline to maintain water quality and prevent issues with start-up. When pumping resumed, Virginia Beach learned that the pipeline was resilient and could recover with minimal effort.

Using that experience, Steve and his team are able to shutdown the major energy consuming equipment at the pump station - including the pumps and industrial HVAC system - within one and a half hours of being notified of a DR event. They've learned that participation without their generator is worth the extra effort of executing full shutdown and start up procedures, which requires monitoring the SCADA system and gradual reduction and startup of pumps to prevent water hammer.

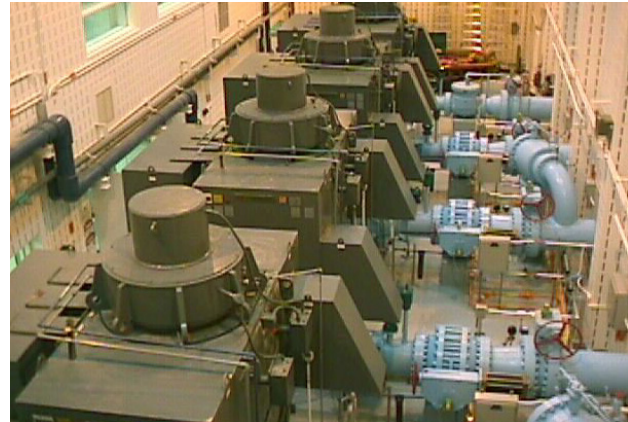


Inside the Lake Gaston Pump House

Lake Gaston Water Supply Pipeline Demand Response Earnings

	kWs SUBMITTED	EARNINGS \$
2010/2011	1843	\$99,676.00
2011/2012	1557	\$53,311.00
2012/2013	1759	\$30,685.00
2013/2014	620	\$10,670.00
2014/2015	1548	\$27,137.00
2015/2016	1661	\$61,267.00
2016/2017	1337	\$24,353.75
2017/2018	1340	\$44,085.73
2018/2019	1258	\$58,536.69
TOTAL	12,923	\$409,722.17

Leigh Anne told Steve that, because Lake Gaston (and the City of Virginia Beach) participate through DMME's demand response program, there would be no consequences for not participating in a test or event. "The great thing about the DMME contract with CPower," Leigh Anne explains, is that you really cannot be penalized. You'll never owe anything. The worst that can happen is you'll earn zero dollars for that test or event."



CPowered Solutions: DMME + CPower Demand Response

Steve and his team had proven that pumps could be shut all the way down and brought all the way back up, on demand, with no damage to pumps and pipelines. He could curtail his assets enough to continue to participate in DR. The question remained, though: Would it be enough? "We were worried," Steve says, "that if we didn't cooperate or couldn't participate in the test or event, there would be a penalty." That could erase any financial benefit.

Fortunately for Steve, he had Leigh Anne Ratliff, CPower Account Executive, working with him. Leigh Anne has been with DMME since the inception of the joint DR program, and with Lake Gaston since they enrolled in the program in 2010. (She also works extensively with the City of Virginia Beach.) No one is as familiar with the DR program and Lake Gaston's participation than Leigh Anne.

The Results: An Oasis of Cost-Saving Revenue

With penalties off the table and a successful pump shutdown protocol established, Steve continued Lake Gaston's enrollment in the DMME DR program. He has yet to see zero dollars earned.

"We're committed to saving money and being good stewards of public resources," Steve says. "CPower is very supportive and encouraging for us to participate, to meet our commitments. When I first stepped into this position and informed my supervisors about the program, we all thought it was just too good to be true. But it has really worked out, and we are happy to continue participation."

This is printed on Rainforest Alliance Certified Paper, a 20-30% recycled and chlorine free product.



At CPower, we understand that energy management is not a one-size-fits-all endeavor.

We create optimized demand-side energy management strategies that help businesses streamline their energy usage, offset costs through demand response participation and reach their sustainability goals. CPower is a leading provider of demand-side management services to commercial and industrial customers across the U.S. with 25+ years of knowledge and experience in helping customers implement intelligent energy management programs.

For more information, contact us at 1.844.276.9371

to find out if you could earn payments via Demand Response programs or services that may be available in your region.

Follow CPower on Twitter @cpowerenergy, connect with us on LinkedIn, and learn more about our demand-side offerings at CPowerEnergyManagement.com.

